

EDU 7702-8-2

by Michael Higley-vance

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EDU7702-8

Dr. Mark Kelso

Online Learning Communities

Activity #2: Validity in e-Learning

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Validity: Construct, Internal, External, & Conclusion

The term, blended learning, which combines face-to-face and online learning, has been discussed by experts as a favorable alternative to traditional only classroom instruction (So & Bonk, 2010). Although blended learning approaches to education are becoming widely accepted and implemented, there is still research to be conducted in support of current learning theory and the partnering of technology. Even more research is lacking addressing the effects of technology use in education on student discipline. This paper aims to address the term validity in direct relation to research and its importance to the proposed research topic.

Validity refers to the accurate representation of information found in research. There are four types of validity, which are described using the following terms: construct, internal, external, and conclusion validity (Cozby, 2009; Trochim & Donnelly, 2008). Each validity type gives researchers a different perspective in which to view particular research topics and investigations. The process of research informs on the implementation of theoretical concepts and the application of theory (Burchett, Umoquit, & Dobrow, 2011; Tolutiene & Domarkiene, 2010). ¹ Only through research can theory be developed, tested, and advanced. Research ¹ broadens and strengthens theoretical ideas, but only if it is based on verity (Trochim & Donnelly, 2008). ¹ Ultimately, only through valid research can the acceptance or rejection of a theory be justified. According to Trochim and Donnelly (2008) the foundation of verity in research is validity. Research validity asks researchers to answer three key questions about their research; (a) does the ¹ variable accurately represent the concept or truth that is being pursued, (b) how strongly can a causal relationship be established between two variables, and (c) how well do the results convey universal truth that is fully generalizable (Cozby, 2009)? Individual scholars label the concepts differently, but the underlying systems and concepts are similar.

Construct Validity

The most important type of validity and hardest to identify is construct validity (Johnston et al., 2014). Leedy and Ormrod (2010) stated that construct validity is the “extent to which an instrument measures a characteristic that cannot be directly observed but is assumed to exist based on patterns in people’s behavior” (p. 92). Cozby (2009) indicated that construct validity is focused on the research variables being tested and “the adequacy of the operational definition of variables” (p. 85). Meltzoff (1998) stated that the focus of construct validity is on the results and the extent that those results relate to a fundamental psychological construct. In research studies involving theoretical constructs, it is important that measures have good content validity (Johnston et al., 2014). The common ideal for construct validity is how closely the research investigates what is being tested.

Threats to construct validity. The greatest threat to construct validity is inexperience in implementing research (Cresswell, 2009). Johnston et al. (2014) states that construct validity needs to be established within the suggested theory before testing should begin. A construct is inadequately defined when its essential components have not been clearly thought out (Lund Research Ltd., 2012), no exact or operational definition can be determined or provided (Cresswell, 2009), and insufficient information has been provided to explain its content (Johnston et al., 2014; Lund Research Ltd., 2012). If construct validity is missing in research nothing else matters. For example, if a researcher believes that he or she is measuring learner interest but is instead measuring learner participation, the research lacks validity because it is not evaluating the construct that it purports to analyze. To address this threat, it is necessary to enlist the help and input of content experts and experienced researchers (Trochim, 2006). Use of experts is essential to formulating strong construct validity (So & Bonk, 2010).

1 **Impact and threats on envisioned research.** I envision in my research to investigate whether a blended technology use has an impact on student discipline in the traditional classroom environment. **1** The independent variable of using or not using technology is easily defined and thus has construct validity. The concepts of learner interest and perceived student learning however, are not so easily quantified since they cannot be heard or seen. To measure learner interest or perceived learning **1** it is essential to have an instrument that will accurately represent and depict differences in and between these concepts. The Learner Satisfaction, Mitchel SI scale, and Transfer-of-learning Questionnaire (LSTQ) were developed by researchers to address this need (Gunawardena, Linder-VanBerschot, LaPointe, & Rao, 2010; Linnenbrink-Garcia et al., 2010).

Internal Validity

1 A leading influence in research is to seek answers to questions regarding what causes what to happen (Trochim, 2006). **1** When evaluating a claim that an outcome is caused by, the basis of the analysis should be grounded in internal validity (Trochim & Donnelly, 2008). Internal validity refers to the ability of the researcher to draw inferences about casual relationships from data (Crozby, 2009). Additionally, Crozby (2009) states that internal validity is increased when cause and effect actions are considered and applied to the research.

1 **Impact and threats on envisioned research.** Random assignment of subjects to groups affords the strongest possibility of establishing a causal relationship, while a nonrandomized assignment **1** provides the weakest internal validity (Trochim & Donnelly, 2008). In my research I expect to use a regression-discontinuity design because it will help determine whether using technology to impact student discipline is effective. Unlike many other research designs, the experimental group in regression-discontinuity requires that learners will be assigned to the

blended education program based on a pre-determined amount of discipline points earned during the prior school year. The control group will consist of learners who do not currently meet the established discipline point criterion and who have no history of discipline concerns. With an established criterion applied to one control and one experimental group, within the traditional school environment, ¹ reasonable internal validity can be expected. Furthermore, internal validity may be increased using the control group results for statistical manipulation to approximate randomization effects (Wright, 2006).

External Validity

According to Crozby (2009) external validity attempts to apply operational definitions of the variables to a variety of settings and situations. The role of external validity determines ¹¹ whether or not an observed casual relationship of a study should be generalized to other populations, measures, and settings (Trochim & Donnelly, 2008; Calder, Phillips, & Tybout, 1982). ¹ The effects of chance, imperfect conceptualizations, and deficient understanding of associations makes determining the generalizability and external validity extremely unlikely (Crozby, 2009; Lynch, 1983). ¹⁶ Calder, Phillips, and Tybout (1982) postulate, “external validity may be sacrificed in favor of addressing threats to internal and construct validity” (p. 240). However, ⁶ considering external validity to be unimportant can prevent researchers from thinking critically about how variables might alter the effects of theoretical variables (Lynch, 1983).

Threats to external validity. In addition to identifying appropriate external validity researchers must also consider the potential threats (Cresswell, 2009). Crozby (2009) states that internal validity may conflict with external validity without the use of field experiments supported within the study. According to Calder, Phillips, & Tybout (1982) “construct validity

11 is necessary but not sufficient condition for external validity (p. 242). Additionally, any incorrect inference regarding the application of a studies finding applied to an incorrect population or sub group weakens external validity (Trochim & Donnelly, 2008). External validity can never be guaranteed because the variables are too great to anticipate and control. 6 However, with continued research and “improvement of both theory and external validity remains a worthy goal” (Lynch, 1983, p. 111).

Threats to external validity arise when findings overstep subject traits, geographical diversity, 1 or timeliness of the study, which weakens the validity of the findings (Creswell, 2009). For example, if all of the subjects of a study were males between the ages of 10-14 it is inappropriate to make inferences regarding males between the ages of 15-18. 1 If a relationship study is conducted exclusively at a public high school it is unsuitable to make inferences regarding relationships with a private elementary school. Finally, if a study focuses on digital natives of the 21st century classroom it is inappropriate to make inferences about their grandparents in the early 20th century classroom.

1 **Impact of external validity and threats on envisioned research.** The prospective subjects for my research are middle school learners between the ages of 12 and 14 years, who are of mixed gender, and technical background. Qualifying subjects are only participating in the blended learning classroom during the normal school day of 7 am to 2:30 pm. Extending the findings of my study to other blended learning environments across other grade and age groups seems feasible. Another consideration regarding my envisioned study is that the data collected will be done over a period of nine school months and it is possible that subjects who enroll throughout the school year, from varying locations and school districts, have vastly different

behavioral characteristics or documented discipline points than those of currently enrolled subjects.

Conclusion Validity

Of the four types of ¹validity, conclusion validity is the least considered and most ¹misunderstood (Trochim, 2006). ¹Conclusion validity, also referred to ³as statistical conclusion validity, is the degree to which conclusions are reached about reasonable relationships from observed and collected from data. According to García-Pérez (2012) ³statistical conclusion validity holds true when the conclusions of a study “are founded on an adequate analysis of the data...” (p. 1). When researchers compare and contrast a relationship, essentially there are two potentially possible conclusions; a relationship exists or that one does not. In either case, the threat to conclusion validity is that research conclusions and interpretations of the data could still potentially exist among the findings (Cresswell, 2009). For example, researchers might conclude that there is a relationship between female and male behaviors during a particular time of day when in fact there is not, or infer that there is no relationship when one does exist. In many circumstances, conclusion validity is the most important of the four validity types because it is relevant when deciding if there is a relationship within personal observations (García-Pérez, 2012; Trochim, 2006), which is one of the basic components of my envisioned study.

Conclusion

¹Valid research consists of four dimensions of truth: construct, internal, external and conclusion validity. Construct validity is absolutely essential and the hardest to identify (Johnston et al., 2014; Leedy & Ormrod, 2010). The basis of an analysis, when resulting from a claim, is grounded in internal validity. Additionally, external validity determines whether or not an observed casual relationship of a study should be applied to other populations, geographical

locations, or settings. The closer variables reflect the truth the more likely research findings will reflect and approach truth. Besides construct validity, other validity types exist within a range, and according to the literature have a negative correlation (Trochim & Donnelly, 2008). Furthermore, as the internal validity of a study increases the external validity tends to decrease making it less expandable (Crozby, 2009). Just as equally important, the greater the generalizability the less likely a study will formulate a causal relationship (Crozby, 2009; Lynch, 1983). However, all validity types are necessary and must be considered while designing a research study. Valid research, based on universal truth, only serves to further and strengthen theory and application (Burchett, Umoquit, & Dobrow, 2011; Tolutiene & Domarkiene, 2010; Trochim & Donnelly, 2008).

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